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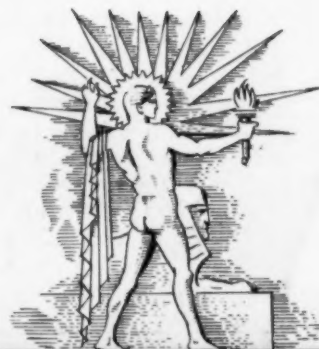
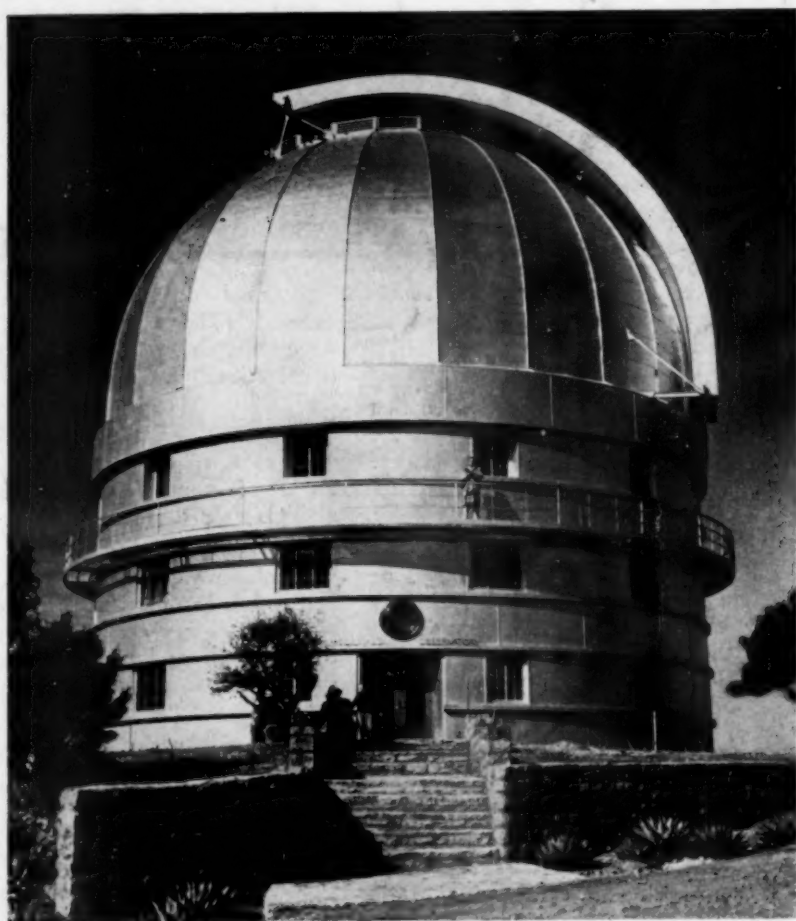
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MAY 1 - 1939

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 29, 1939

Heavenly Looking Glass

See Page 261

A SCIENCE SERVICE PUBLICATION

Do You Know?

The world's population increases at a net gain of 100,000 a day—the size of a city.

The American or bald eagle is protected by some States but not by the United States Government.

A new refrigerator has a separate compartment so cold that it would be possible to quick-freeze foods at home and keep them frozen until needed.

Puerto Rico plans to increase production of such wartime materials as alcohol, camphor, hemp, jute, palm oil, iodine, quinine, and coconut shells.

Government scientists are finding out what makes a good diet for bobwhite quail, to aid those who may propagate these birds or conserve them in the wild.

Workers in automobile factories have added to American slang a whole list of names for car parts, such as dog collar, tin hat, pancake, spider, and banjo.

Goldenrod is a boon to fishermen; they gather and store stems containing bulb-like swellings, knowing that these contain eggs which will hatch into grub bait.

Cultured pearls are usually at least three-fourths "core" in their diameter, and have a comparatively thin coating provided by the oyster, is the conclusion of Dr. A. E. Alexander of the Mellon Institute, based on study of hundreds of cultured pearls.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

ARCHAEOLOGY

How are an American team of workers attempting to preserve the designs of historic stained glass against the hazards of war? p. 264.

ASTRONOMY

What new discoveries may be expected from the new McDonald Observatory? p. 261.

What star marks the heart of the scorpion? p. 263.

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BIOLOGY

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ENGINEERING

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GENERAL SCIENCE

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INVENTION

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What invention makes it possible to hem and seam garments without sewing? p. 264.

PHYSICS

What is the newest element, made in the atom smasher? p. 265.

What new type of research has been undertaken in the U.S.S.R.? p. 264.

What old magician's trick is being used to mystify museum visitors in modern New York? p. 262.

PHYSIOLOGY

Why is the saying "For every child a tooth" not considered true? p. 264.

ZOOLOGY

What animal is guilty of the bulb eating blamed on moles? p. 265.

Pet raccoons in Chicago's Trailside Museum enjoy wrestling matches that sometimes last an hour.

Some experiments have indicated that dull blue walls in operating rooms are helpful to the surgeon, causing less eye strain than white.

An Illinois naturalist reports seeing local green or grass snakes that had no blue in their coloring, leaving them a yellowish-buff; also one grass snake with the opposite condition of being black-blue, lacking the yellow in its make-up.

National Park Service naturalists counted 108 species of birds in one spring month at Boulder Dam Recreational Area.

Skill of Britain's Bronze Age metal workers is shown in a spirally twisted torque of about 1100 B. C., made from a single gold bar over 50 inches long.

Wool growers are reported to be alarmed over increasing use of delustered rayon which is cut to any length fiber desired and combined with wool so skillfully that experts find it hard to detect.

SCIENCE NEWS LETTER

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GENERAL SCIENCE

Severe Facial Neuralgia Treated With Vitamin B₁

Spring Meetings of the National Academy of Sciences Brings "Senate of Science" Together for Discussions

VITAMIN B₁ and liver extract have been used successfully in the treatment of major trigeminal neuralgia or tic douloureux, a nervous disease characterized by agonizing pains in the face, usually on one side. The new treatment, and studies on the physiology of the malady, were made known to the meeting of the National Academy of Sciences by Drs. H. Borsook, M. Y. Kremers and C. G. Wiggins of the California Institute of Technology.

At first, treatment consisted of daily injections of vitamin B₁ without the addition of the liver extract.

"Ten cases have been under observation for 11 months; 42 cases for six months," Dr. Borsook reported. "Of the cases observed for 11 months seven became practically symptom-free in three months after treatment was begun and have remained so without further injection of vitamin B₁. Two improved to a lesser degree. One showed no improvement. Essentially the same results were observed in the other 42 cases under observation now for six months."

Ten cases that failed to improve when treated with the vitamin alone were given a combination treatment of vitamin B₁ and liver extract injections. The doses were large, and frequently administered. Marked improvement was noted in from three to four months. No cases have yet been treated with liver alone.

In concluding, Dr. Borsook stated, "There are among the cases showing marked improvement a number over 70 years old who have had the disease in some instances for more than 20 years."

Dynamos in the Fishbowl

INHABITANTS of the goldfish bowl are converted into miniature dynamos by spinning them around on a turntable, generating a real (if slight) electric current, and thereby proving the existence of an electro-dynamic field in animals, in experiments demonstrating the electrical state of living animals by Prof. H. S. Burr of Yale University.

"In the growing embryo the electrical pattern develops hand in hand with the

development of the whole organism," said Prof. Burr. "Under proper conditions it has been possible to record electrically the exact instant of ovulation in rabbits, cats and women. The progress of healing in wounds shows electrical concomitants which parallel very closely the reparative process."

Prof. Burr also described an electrical method for the detection of one type of cancer, thus far tried only on mice. The electrical state of the animal shows a characteristic change, a week or more before the cancer can be detected by feeling the part of the body affected.

Can Foretell Weather

"I WOULD like to convince the Academy and the public that there is an untried method of forecasting weather which seems competent to predict principal weather changes for two weeks in advance."

With this challenging statement Dr.

Charles G. Abbot, secretary of the Smithsonian Institution, opened his report to the National Academy of Sciences. And he concluded by calling for the inclusion in the national budget of \$200,000 a year for the maintenance of ten special observatories for watching the changes in solar radiation which he declared precede major weather changes on the earth.

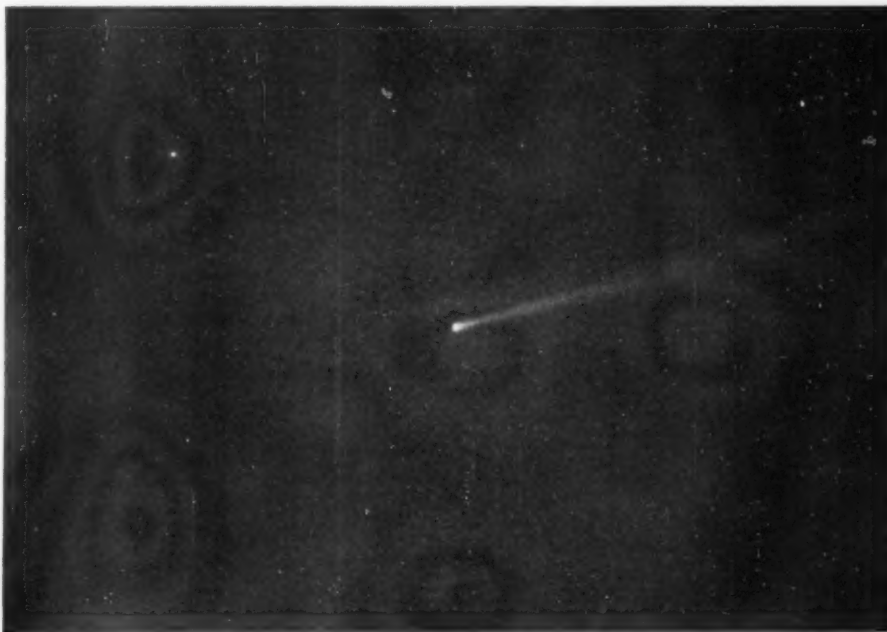
"It seems too bad," he said, "that with a Government budget of many billions of dollars, this almost trifling amount is not available to try this promising method of long-range weather forecasting."

Dr. Abbot exhibited charts showing an apparent close correlation between relatively small shifts up and down in solar radiation intensity and large weather changes during days that followed. The correlation between the two sets of data is eleven times that to be expected on the basis of pure chance, he declared.

The amount of change on earth is out of all proportion to the amount of change in the solar radiation, Dr. Abbot pointed out. Changes in solar radiation average only seven-tenths of one per cent., he said, but they are often followed by changes of ten or twenty degrees Fahrenheit in terrestrial temperatures.

"Heart Flutter" in Plants

"H EART flutter," the distressing condition that arises when the various sections of the body's vital blood-pump work at cross-purposes instead of



COMET HASSEL

This photograph through the telescope of Harvard Observatory shows the four-degree tail somewhat exaggerated because of the movement of the comet across the camera's field of view during the 25-minute exposure. (See page 270)

in rhythmic harmony, has been reproduced in its essential electrical mechanics in the large cells of the water plant known as *Nitella*. Drs. W. J. V. Osterhout and S. E. Hill of the Rockefeller Institute for Medical Research reported.

The cells of *Nitella* do not pulsate like hearts, but they do have rhythmic electric currents, known as action currents, that sweep through their protoplasm at regular intervals—15 to 30 seconds under normal conditions. The same kind of rhythmic currents, occurring more frequently, are responsible for the regular beating of the heart.

In the heart, the action currents originate in a physiological center known as a "pacemaker." So long as it keeps sending out its signals at the normal rate, all is well. If anything causes it to increase the rate abnormally, the rhythm of the parts is broken, and "flutter" or "block" results.

By appropriate chemical treatment, continued for several weeks, isolated cells of *Nitella* were given artificial pacemakers that speeded up the rate of the action-currents to once a second. The physiology of the cells proved unable to stand the pace; conditions arose closely resembling the electrical states of "flutter" and "blocked" hearts.

Control of Evolution

CHEMICAL control of evolution has now been extended to molds and other fungi, it was reported by Drs. Charles Thom and Robert A. Steinberg of the U. S. Department of Agriculture. They were impelled to try to change the course of heredity in these lower plants by the recent successes in changing the genetics of flowering plants with the drug colchicine.

Colchicine and other chemical reagents had no effect on the several strains of mold on which the two experimenters worked. However, when they grew their cultures on a medium containing sodium nitrite, changes in character that appear to be stable and permanent developed.

Vitamin Need Increases

STERILITY due to lack of vitamin E, the fertility vitamin, becomes increasingly difficult to overcome with advancing age, it was shown in experiments with rats conducted by Prof. Herbert M. Evans and Dr. Gladys A. Emerson of the University of California.

Young female rats reared on a vitamin E free diet are unable to bear

young. A comparatively small amount of the vitamin will enable them to reproduce, if given in early maturity. At eight months of age, this initial curative dose no longer suffices, but if doubled or trebled the rats will still become sexually normal. At a year, the dose has to be multiplied by eight or ten to be effective. In still older rats, embryo development can be initiated, but is never carried through to birth, no matter how much of the fertility vitamin they are given.

New Canyon Explanation

A NEW hypothesis to account for the great canyons known to exist under the sea, cut deep into the continental shelf, was offered by Prof. Douglas Johnson of Columbia University. Subterranean streams of water, such as

are known to cause canyons on land through undermining and collapse of surface layers, may also have operated in the sea-bottom sediments, he suggested.

This hypothesis, if accepted, would do away with one of the most troublesome angles of the explanation most generally accepted at present, Prof. Johnson pointed out. This theory holds that the canyons were formed by ordinary stream cutting while the present sea bottom was dry land, and that subsequent sinking "drowned" the coast and the canyons with it. The difficulty is that some of these canyons are now submerged to depths of several thousand feet, and it is hard to account for that great subsidence of the land or rise in the sea level.

Science News Letter, April 29, 1939

BOTANY

Plant Tissue in Test Tubes; Made to Develop Small Plants

PLANT TISSUE that is neither root, stem nor leaf, but "just plant," is kept growing in test tubes at the Rockefeller Institute for Medical Research laboratories in Princeton, N. J., by Dr. Philip R. White. Potentially immortal, these masses of plant cells can be made to develop and differentiate into small plants at the will of the experimenter. At the meeting of the Torrey Botanical Club, New York, Dr. White described his technique and its results.

The principles would apply to any of the higher plants; the actual species used by Dr. White are tobacco and tomato. The outer layers of the stem are peeled away, and a conical piece broken out of the growing tip. All the work is done under aseptic conditions, for the presence of bacteria or fungi would quickly cause decay and destroy the cultures.

The bits of stem-tip tissue are placed on a mixture of mineral and organic nutrients solidified into a jelly with agar. They develop outgrowths of cell masses, that can be cut off and re-propagated in the same way, indefinitely.

So long as these cell-mass cultures are kept on the nutrient agar jelly they continue to grow as undifferentiated tissue—stuff that is "just plant." But if they are taken off the jelled substratum and dropped into a liquid solution containing the same food substances they sink

to the bottom and presently produce first stems, then leaves and roots—complete plantlets.

Why these masses of generalized plant cells should be induced to turn into differentiated and specialized stem, leaf and root tissues by being thus immersed, Dr. White declared himself unprepared to state positively. He conjectured, however, that the difference between the oxygen supply at the top and at the bottom of the solution may have something to do with it.

These masses of plant tissue have been kept growing for 18 months, divorced from the original parent plants, Dr. White told his listeners. Next step in the research is to see whether plant cells can be grown as separate individuals, instead of in the tissue masses as at present.

Science News Letter, April 29, 1939

● RADIO

Dr. William C. Sandy, director of the Bureau of Mental Health of Pennsylvania, will be the guest scientist on "Adventures in Science" with Miss Jane Stafford, medical writer, Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, May 8, 5:45 EDST, 4:45 EST, 3:45 CST, 2:45 MST, 1:45 PST. Listen in on your local station. Listen in each Monday.



FIRST PHOTOGRAPH

The moon was first to pose before the new 82-inch diameter mirror of McDonald Observatory. Seldom will the new telescope be aimed at such near-by objects. Extremely faint stars and great gas clouds will be investigated.

ASTRONOMY

Texas' New Telescope Giant Goes Into Action In May

Great Glass Mirror, Nearly Seven Feet Across, Will Search for New Dwarf Stars and Clouds of Glowing Gas

See Front Cover

UPON a mountain top in Texas, science has a new looking glass for the heavens. It is the second largest telescope in the world, and the most perfect.

The great glass mirror of McDonald Observatory is nearly seven feet across, 82 inches in diameter. Its shiny coating of aluminum is laid on an arduously and patiently fashioned glass surface accurate to a millionth of an inch.

Astronomers expect great discoveries from this precise tool for exploration of the universe, this \$800,000 investment that will pay dividends in scientific knowledge.

Watch for these discoveries!

New white-hot, dwarf stars so compressed that they are as tiny as our earth, with each cubic inch weighing several tons.

New clouds of glowing gas in the universe, remains of disintegrated stars and planets.

Mt. Locke towers nearly 6,900 feet in the Davis Mountains resort region of

western Texas. McDonald Observatory's great dome perches upon it, tall as a five story building, shiny, electrically operated, center of a little scientific colony, 45 miles remote from the railroad and 16 miles from the closest village.

Two great universities cooperate to operate this outpost of astronomy. With a bequest from a Paris, Texas, banker, William J. McDonald, the University of Texas paid for the observatory. The University of Chicago, long parent to famous Yerkes Observatory at Williams Bay, Wis., joins in its operation. For nearly six years, the Warner & Swasey Company of Cleveland, builder of precision machine tools and telescopes, has been designing and constructing the telescope and observatory, fashioning the mirror from a great glass disk poured at Corning, N. Y.

Finally on May 5, in the presence of a notable gathering of American and foreign astronomers, the new observatory will be dedicated. The completed observatory is pictured on the front cover

of this week's SCIENCE NEWS LETTER.

Already the great glass has been swung into action under the guidance of Dr. Otto Struve, director of McDonald and Yerkes Observatories. It is living up to the hopes of the astronomers.

Only One Larger

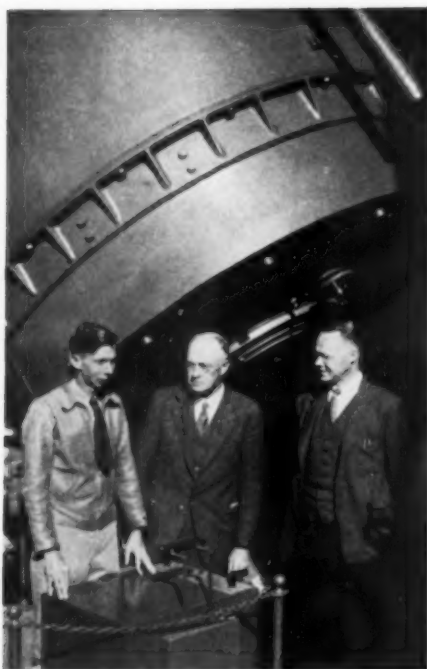
Only the 100-inch telescope, in operation for two decades on Mt. Wilson, Calif., now exceeds in size the McDonald telescope. Both these telescopes will be topped in size by the 200-inch reflector for Mt. Palomar, Calif., when it is completed, probably next year. But such heavy astronomical artillery is too precious to be used competitively. Each of these great telescopes has its own tasks. The operating astronomers cooperate in making their plans so that their precious observing hours are not wasted in duplication.

If a man could fly 3,000 miles out in space, the McDonald mirror could still pick up his image. So powerful is it that photographs can be taken of stars which are a million times fainter than the faintest seen with the unaided eye. Some of these stars are so distant that it takes light 400,000,000 years to travel from them to earth.

The observatory itself is a three-story cylindrical house, surmounted by a 62-foot diameter hemispherical dome containing the telescope itself. The telescope is 26 feet long and weighs 75 tons, including the three-ton mirror. But so carefully poised is the instrument that a one-third horsepower motor drives it accurately to a hair's breadth. The dome weighs 115 tons and the telescope is sighted at the heavens through an 18-foot wide slot.

Dr. Struve, director of McDonald and Yerkes Observatories, comes of an astronomical family, his father, grandfather and great-grandfather having been world-famous astronomers in Russia under the Czars. Dr. C. T. Elvey is second in command at McDonald Observatory. Other McDonald-Yerkes astronomers who will use the new telescope are: Dr. George Van Biesbroeck, famous for comet observations; Dr. G. P. Kuiper, who specializes on extra-heavy dwarf stars; Prof. W. W. Morgan, authority on star spectra; Prof. S. Chandrasekhar, who specializes on the constitution of stars, and Prof. Karl E. Seyfert. Prof. Chandrasekhar is an East Indian, and his name is appropriate to an astronomer since it means "the man who carries the moon." He happens to be a nephew of Nobelist C. V. Raman.

Most of the large telescopes are of the



THE MIRROR END

Near the electric control of McDonald Observatory's great 82-inch telescope are Dr. Otto Struve, director (right), Dr. H. G. Gale, head of the University of Chicago's physics department (center) and Dr. C. T. Elvey, second in command (left).

reflecting or mirror type like that of McDonald Observatory. Among these large reflecting telescopes smaller than McDonald's 82-inch are: Dunlop Observatory's 74-inch near Toronto, Dominion Observatory's 72-inch at Victoria, British Columbia; Ohio Wesleyan's 69-inch at Delaware, Ohio; Harvard's 61-inch at Oak Ridge, Mass.; Harvard's 60-inch in South Africa. The largest of the refracting or lens telescopes is at McDonald's older sister institution, Yerkes Observatory, Williams Bay, Wis., which has a 40-inch instrument.

Science News Letter, April 29, 1939

Adding calcium salts to tomatoes is found effective in keeping the tomatoes firm and whole in canning.

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:

Tuesday, April 18, 1:22.7 a. m., EST

On coast of Chile, near the town of Copiapo. Latitude 27 degrees south, longitude 71 degrees west.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13.

BIOLOGY

Sex Determination In Rats Achieved Through Diet

When Fathers Eat Lots of Protein and Mammals Eat None, The Babies Born Include Larger Proportion of Males

IF MEN were rats, Papas wanting sons might be advised to eat all the beefsteaks and other protein foods at the family dinner table, leaving only a small bit for the mammas.

This sort of diet—high protein for the papas and low protein for the mammas—when fed to rats resulted in a sex ratio of 145 males to 100 females in the offspring, Drs. F. Hoelzel, Esther Da Costa and Prof. A. J. Carlson of the University of Chicago have just announced.

When the diets of the same rats were reversed, giving the mammas more protein than the papas, the sex ratio in the offspring was reversed to 92 males to 100 females.

"This is a striking decrease in the male ratio as the normal seasonal (spring) effect is an increase in the male ratio," the Chicago scientists comment in reporting their findings to the Society for Experimental Biology and Medicine.

"It is too early to say whether diet could be used to practical advantage to control sex in animal breeding," Dr. Hoelzel replied to a Science Service inquiry.

"Our results however may mean that the greater number of boy babies, particularly after some wars, are due to the fathers obtaining a higher proportion of protein in the diet than the mothers.

"The most significant suggestion from our results seems to be that the 30 to 40 per cent. of abortions or resorptions of fetuses that are known to occur in domestic animals and humans may be serving an important role in evolution by eliminating the least fit at this early stage of life."

The theory that the better nourished parent tends to determine the same sex in the offspring was proposed many years ago. These studies seem to confirm the theory.

The explanation given by the Chicago scientists is that the state of protein metabolism induced in the parent evidently also affects the germ cells and tends to determine the survival value of the same sex among the embryos.

"The survival of a larger percentage

representing the better nourished sex might be due to the expected transmission of sex-linked characteristics. The results would also be explained if mammalian reproduction is a modification of parthenogenesis in which each sex tends to reproduce itself with survival of the fittest."

Science News Letter, April 29, 1939

PHYSICS

Magicians' Trick Puts Glasses on Museum Guests

AN OLD-TIME but still mystifying trick of magicians is being used to "fit" visitors with spectacles in a new exhibit at the New York Museum of Science and Industry.

In its new Hall of Optical Science, prepared especially for the World's Fair visitor, one looks into the exhibit and sees his face reflected apparently from a regular mirror. But across the bridge of his nose is superimposed any one of six pairs of spectacle frames from the old-fashioned kind of Ben Franklin's epoch to the modern streamlined style.

It's done with a mirror which is only half-silvered and semi-transparent.

Behind it is a revolving drum on which are mounted six different kinds of spectacle frames. The visitor looks at the mirror, sees the reflection of his face and at the same time sees a pair of spectacles behind the mirror so aligned that the spectacles appear to be on the observer's nose.

The spectacles can be "changed" by turning a knob.

The new exhibit, showing also basic principles of optical science and the manufacture of optical parts, were first displayed at a special luncheon (April 20) honoring the 25th anniversary of William Bausch's first experiments in making optical glass in what is now the Bausch and Lomb Optical Company plant.

Science News Letter, April 29, 1939

Far from being simple H₂O, ordinary water contains 33 substances, an engineer points out.

ASTRONOMY

Lion and Scorpion

Summer Constellations Begin to Appear in Evening Sky; Venus and Other Planets Visible Only After Midnight

By JAMES STOKLEY

WITH the coming of May, the evening skies begin to take on a summery appearance. To the southeast, the Scorpion is beginning to show. Antares, the red star which marks the heart, is shown on the map just above the horizon. This is the position at 10:00 p. m., standard time, on May 1; at 9:00 p. m. on the 15th and at 8:00 p. m. on the 31st. An hour or so later the rest of the animal is visible, a long, hook-shaped row of stars forming the characteristic curved tail.

The accompanying maps also show the other stars that are visible at the times mentioned. High in the southwest is Leo, the lion, with the "sickle," another hook-shaped group. Regulus marks the end of the sickle's handle, which is below. Between Leo and Scorpion is Virgo, the virgin, in which Spica is the brightest star. To the west we find, rath-

er low, Procyon, in Canis Minor, the little dog. Next, to the north, are the Gemini, the twins, with the stars Castor and Pollux above. Then comes Auriga, the charioteer, with Capella, and, low in the north, Cassiopeia, the queen, a group shaped like a letter W.

High in the north is Ursa Major. The best known part of this figure is the "great dipper," now turned upside down, with the bowl to the left. The two stars of the bowl, farthest from the handle, are the "pointers," whose direction, now downward, indicates Polaris, the pole star. This is part of the "little dipper," which, in turn, is part of the little bear, Ursa Minor. By following the line of the curved handle of the large dipper, we come to Arcturus, in Bootes, then to Spica.

To the northeast we can see the brightest star now visible, Vega, in Lyra, the lyre, which will shine overhead on summer evenings. Below the lyre is the

swan, Cygnus, of which the star Deneb is part.

No planets are in a position to be seen during the evening this month, but Mars, in the constellation of Sagittarius, rises in the southeast about midnight. It can easily be located because it is red in color, and very bright.

About two hours before sunrise Jupiter, even more brilliant than Mars, comes up. An hour before the sun, Venus, still brighter, appears, but by then the sky is beginning to show signs of the approaching dawn, and the stars and planets are disappearing.

Saturn is close to Venus, and Mercury is also, about May 1, but they are much fainter and will be difficult to see.

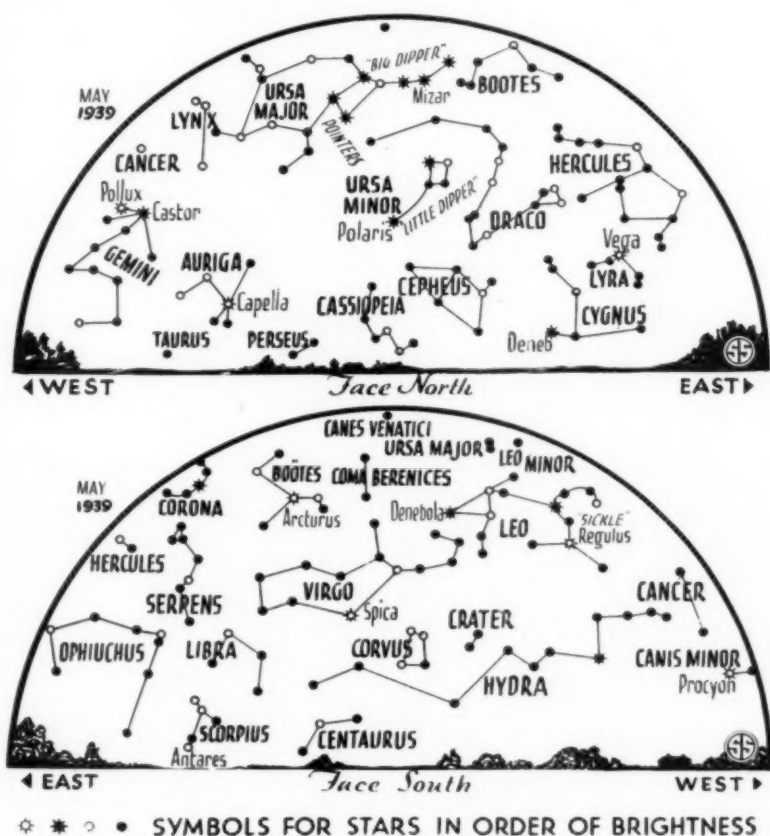
On the night of May 1 the moon will pass in front of the star Spica. This kind of an eclipse is called an occultation. Although the occultation of Spica can be seen with the unaided eye, some sort of optical aid, even a pair of opera glasses, will greatly help the view. It happens that the moon is then almost full and very bright, so the glasses will make it easier to see the star.

In the course of the month, the moon moves across the sky toward the east, and so, when one looks early in the evening, the star will be to the left of the moon. Then the eastern edge of the moon, which is dark, will pass in front of the star.

When this happens, the star vanishes instantaneously, even more quickly than an electric light going out when the switch is opened. This is an effect of the lack of a lunar atmosphere. If there were a layer of air above the moon's surface, the star light would gradually have to shine through more and more of it, and the diminution in light would be gradual.

Sometimes we see the planet Mars eclipse a star, and then this happens, because Mars, like the earth, has an atmosphere around it. After about an hour, the star reappears, because the moon has moved across it. The reappearance, of course, is from the right hand, the bright edge of the moon.

Since the moon is moving easterly, people in the western part of the United States will see the star vanish and reappear first. In California the disappearance will come about 7:42 p. m., Pacific Standard Time, and the emergence at 8:46 p. m., P. S. T. (Turn to page 269)



PHYSIOLOGY

Pregnancy Not a Cause Of Mother's Tooth Decay

PREGNANCY is not a cause of tooth decay, but if the expectant mother's teeth need dental attention, it is perfectly safe for her to have it, in the opinion of Prof. Daniel E. Ziskin, of the Columbia University School of Dental and Oral Surgery.

Even the idea that if the expectant mother's diet does not contain enough tooth-building substances for baby's teeth, her own will suffer is labelled false by Prof. Ziskin.

"The association of tooth decay with pregnancy," Prof. Ziskin said, "is based largely on the supposition that the unborn child, acting in parasite-like fashion, extracts calcium from the teeth of the mother to supply its own needs. This is untrue. Even if through a dietary lack the child absorbs calcium from the mother's body, the bones or other placings of calcium storage are affected, but not the teeth. The fact that in certain diseased conditions the bones may lose large quantities of their calcium leads some to believe that the teeth are also affected. But there is no scientific foundation for this theory."

Science News Letter, April 29, 1939

CHEMISTRY

Scientists Taste Carrots Canned Over Century Ago

EACH DAY hundreds of thousands of housewives throughout the land grab a can opener and warm up tasty carrots for dinner. How would you like to taste carrots canned over 115 years ago? British scientists have recently been doing it in an extensive study of the properties of canned foods carried on historic English expeditions of more than a century ago which sought the famed Northwest Passage.

Canned carrots were carried on the expedition of Capt. Parry which set out in 1819 with the ships Hecla and Griper. To decrease scurvy among officers and crew canned meats and vegetables from the firm of Donkin, Hall and Gamble were carried. With some skepticism the then-new foods were used but the testimony of John Edwards, surgeon of the expedition, praised the canned foods in comparison with the time-honored salted meats and the dried cakes of "portable" soup which previously had been used.

From the Museum of the Royal United Services Institution scientists of the In-

ternational Tin Research and Development Council, headed by Prof. J. C. Drummond, obtained carrots packed for Capt. Parry's third expedition in 1824.

With special apparatus they gingerly opened the cans, analyzed the contained gases chemically and studied the food bacteriologically. The carrots, immediately after opening, looked like fresh cooked carrots which had been allowed to cool. They were bright orange but turned quickly to a dull orange color with a brownish hue. They smelled sweet and to the tongue tasted sweet with a slight metallic flavor from their long contact with the tin can lining.

The modern homemaker accustomed to a variety of foods in cans really owes a debt to exploration and merchant marines of the early 1800's for it was for such use that canned foods first saw their widest service. Nicholas Appert, French chemist, first packed foods with heat in glass bottles and jars about 1800 but it was Bryan Donkin in England in 1810 who adopted Appert's methods to iron containers lined with tin; the primitive equivalent of the modern tin can.

Science News Letter, April 29, 1939

INVENTION

Plastic in Fabric Permits Hemming With Heat

TEXTILES and fabrics can now be "hemmed" in the factory by a new process which replaces the sewing machine with thermoplastic fibers incorporated in the fabric to seal the edges, two patents granted to A. J. Steinberger and assigned to the Celanese Corporation of America reveal.

The new process takes advantage of the fact that materials such as cellulose acetate plastic soften under the influence of heat and pressure. If fibers made of such a material are woven into the fabric, application of heat and pressure to the edges softens the plastic and spreads it as a binder which is firm when cool, according to the patents, Nos. 2,153,351 and 2,153,352.

Besides serving as a "prefabricated" hem for a textile material, the thermoplastic cellulose acetate can be used in another way to the advantage of the consumer, the patents point out: by running a strip of the special fiber along a seam, and then subjecting it to heat and pressure, a durable bond with the seam is formed. The seam then has the firm characteristics of the plastic fiber, and is prevented from wrinkling or puckering.

Science News Letter, April 29, 1939

IN SCIENCE

ARCHAEOLOGY

Photograph Stained Glass Threatened By War Loss

TWO Americans are busily photographing Europe's treasures of glowing, fragile stained glass, in a race for time with the uncertainties of war.

Robert and Gertrude Metcalf of Ohio's Dayton Art Institute have taken 7,000 photographs, traveled 7,000 miles by automobile since last summer. Their goal is to make the first complete photograph record of stained glass windows in England, France, Switzerland, and parts of Belgium and Germany.

The primary purpose of the venture is to procure research material for American students. Mr. Metcalf believes the material will lead to fine creative work in the United States. To obtain the complete record he desires is a two-year task, involving 20,000 photographs, including duplicate sets, and additional water color records.

The Metcalfs have designed stained glass windows in various American churches, including the Cathedral of St. John the Divine and St. James Episcopal Church, both in New York.

Mr. Metcalf rates Chartres Cathedral in France as having the world's finest stained glass, for quantity and quality, although he considers many small windows elsewhere individually better.

Science News Letter, April 29, 1939

PHYSICS

Magnetic Storms, Sunspots Studied By U. S. S. R.

SOVIET astronomers, geophysicists, radio experts, and meteorologists are issuing at ten-day intervals data on the cosmic inconstants, such as magnetic storms, sunspots, conditions of radio transmission, polar lights, and other such phenomena. Reports are published by the Central Geophysical Observatory at Leningrad.

In America for about a decade similar cosmic data have been gathered and issued by radio and bulletins by Science Service in cooperation with the institutions making the observations.

Science News Letter, April 29, 1939

THE FIELDS

ZOOLOGY

Bulb-Eating Mice Use Runways Made By Moles

IF YOU have a mole in your garden and your choicest bulbs get eaten, that is not to be taken as evidence that the mole ate the bulbs, declare zoologists of the U. S. Department of Agriculture. With the exception of a single Pacific Coast species, moles in this country are not vegetarians; they feed on underground insects and grubs.

What happens is that wild mice, especially the short-tailed pine mice, make use of the mole's runways, as infantrymen and machine-gunners make use of trenches and approaches dug not by themselves but by the engineers. These wild mice are vegetarians, and the real bulb-eating culprits.

Science News Letter, April 29, 1939

PHYSICS

Missing Element No. 43 Made in Atom Smasher

THE giant cyclotron "atom smasher" at Berkeley, Calif., has become a mine in which has been discovered, or manufactured, one of the missing elements of the chemical periodic table.

The element is number 43, closely related to manganese, molybdenum, ruthenium, and especially rhodium, to which it is a lighter homologue. Prof. E. Segrè, who might be called the inventor of number 43 rather than its discoverer, made it by bombarding molybdenum with deuterons or with neutrons.

At least five radioactive isotopes of atomic number 43 have been recognized among the products of the bombardment, and some of them have a half-life long enough to allow investigation of the chemical behavior of the element.

Prof. Segrè was one of the associates of Prof. Enrico Fermi of Rome, the Nobelist in physics who is now at Columbia University. Now Prof. Segrè also has come to America to continue his scientific research, working with Prof. E. O. Lawrence at the University of California.

In Rome, the Fermi group pioneered

in discovering new elements by creating them by transmutation from other elements. Prof. Fermi found evidence for the existence of artificially radioactive elements beyond uranium, number 92, which was considered the periodic table outpost, although the more recent splitting of the uranium atom may deprive the world of the reality of these extra-heavy, but fleeting, chemical elements.

The new element 43 has been given a baptism of investigation, despite its transitory existence. For the first time an X-ray spectral line of such a new element, synthesized artificially, has been directly observed.

Chemistry books may list element 43 discovered in 1925 in Germany, but the reality of "masurium", as the supposed number 43 of those days was called, was not considered substantiated by others. Prof. Segrè considers elements 61, 87 and 89 still among the missing in the famous Mendeléeff table. With the ability of scientists to create the element they are looking for, these may soon be created beyond any doubt and thus added to the list.

Science News Letter, April 29, 1939

CHEMISTRY

War Would Bring Setback To Our Chemical Industry

ALTHOUGH the chemical industry is commonly associated in the public mind with its wartime applications, a war now can only bring a serious setback to the chemical industry, declares Edgar M. Queeny, president of Monsanto Chemical Company, in a message to stockholders.

"In the long pull there could be no benefit to our company from war," Mr. Queeny said. "All our normal progress would cease. Our organization would be disrupted."

"We hope that war will be averted so that our organization may continue its efforts in permanently constructive fields."

There would be no repetition of the chemical boom which occurred during the World War, said Mr. Queeny, discussing the impact of a war on modern chemical industry.

The World War caught America without adequate chemical industries, he pointed out, and led to a tremendous spurt in chemical manufacturing which is not likely to be repeated. If war comes now the German chemical industry would not have industrial America at its mercy as it did in 1914-18.

Science News Letter, April 29, 1939

ENGINEERING

Elektro, Newest Robot, Ready For World Fair

NEWEST in an honorable family line that includes Televox, one of the first modern mechanical men, Elektro, the Westinghouse Electric and Manufacturing Company's robot, was pronounced ready and fit to begin display of his 26 tricks at the New York World's Fair, which opens April 30.

Brother of Willie Vocalite, who answers to spoken commands, and is now at the San Francisco fair, Elektro is actually made to do his stuff by varying light signals, which are set off for reasons of convenience and instruction by commands spoken through a microphone.

It takes 900 parts, including 48 relays, to make this seven-foot, 260-pound giant do his stuff. He can even speak 77 words—but 75 of them are on a record while the other two also have a "canned source" and are spoken in response only to definite signals—the flashing of red and green lights.

Elektro will walk, count up to 10 on his fingers, and smoke cigarettes by the dozen for the amusement of Fair visitors, Westinghouse engineers said. To make him do these tricks, the engineers have built into him many of the automatic and electrical devices now seeing regular duty in industry.

Science News Letter, April 29, 1939

AERONAUTICS

Graduate School Offers Rotary Wing Aircraft Study

A NEW graduate curriculum with seven courses and other work leading to an advanced degree will be offered by the New York University College of Engineering in autogiros, helicopters and other types of rotary wing aircraft.

A graduate fellowship in honor of Juan de la Cierva, late inventor of the autogiro, will also be available for award to an outstanding American citizen with the requisite training. The single exception to the citizenship rule, Dean Thorndike Saville of the engineering college said, is de la Cierva's son, Juan, who is Spanish.

Among the students enrolled in the program, it is expected, will be an officer with autogiro experience detailed by Maj. Gen. Henry H. Arnold, chief of the Air Corps.

Science News Letter, April 29, 1939

ENGINEERING

Transportation

Visitors Travelling Across the Continent to Fairs Will See How Earlier Americans Made Such Trips

By ROBERT D. POTTER

TWO great fairs, one at each side of the continent, present transportation problems of moving one of the largest mass migrations of the American public since the World War.

By motor, train, airplane and ship millions of people will travel hundreds of millions of miles to see these two wonder exhibits of 1939. Most of them, on all-too-brief vacations, must travel far and fast. It is modern transportation which has made these two fairs possible, transportation that is a far cry from the slow, uncertain and rough modes of transport of a century ago.

From the first huffing and puffing steam engines of 1839 to the modern speeding streamliners of the modern railroad; from the trudging hoofs of horse and mule to the swift comforts of modern bus and motor vehicle; from slow sailing ships to today's speeding steamships and from nothing in aerial transport to the gleaming swift-flying airliners of the present. These are only a few of the sharp contrasts in a century of transportation.

With the exception of the air the growth of transport by rail, water and road has had the most fundamental part in molding the United States into the nation it is today.

The early 13 states possessed territories west of the Alleghanies which, at one time, offered a serious challenge to

Washington and other early leaders. They saw that the seaboard states might lose control of these "western" lands if something was not done about transportation.

To this end the nation built its great turnpike west from Baltimore to Wheeling, W. Va., where it was possible to tap the waterway network of the Ohio River Basin and thus reach the still-uncolonized lands.

Lumbering Conestoga wagons — the same "covered-wagon" type which later served the pioneers of the far west so nobly in their trek across the great plains and mountains to the west coast—hailed freight over the Alleghany Mountains on this national highway. World's Fair visitors to New York will see such wagons and other historic transportation exhibits when they stop by the New York Museum of Science and Industry in Rockefeller Center.

The National Turnpike might—if invention had been slower in those early days—have marked the first link in a great chain of really fine highways throughout the nation such as are found in France, England and Italy as their heritage from the past.

But America was growing during an inventive age. Even while the National Turnpike westward was reaping profits for trucking and passenger agents its economic supremacy was being buried by dirt tossed from shovels hundreds of miles away in New York State.

There the Erie Canal was slowly worming its way through the state and, when opened, marked the easiest and cheapest way to ship goods over the great distances.

Soon the Erie Canal—maker of cities like Utica, Syracuse and Buffalo—was to have its competition with the railroads but, in the meantime, water traffic surged westward through the Ohio, the Mississippi and the Missouri and their tributaries.

More than any other form of transport the railroads brought economic life to the nation. The growth of the west, in fact, is intimately linked with railroads which suffered few barriers of geography—as did waterways—and drove straight to their goals whatever and wherever they might be.

In ten years—when the railroads came—such a city as Kansas City jumped from 3,000 to 37,000 in population. Denver in two decades grew from 5,000 to 107,000 and Omaha jumped from 16,000 to 140,000 between 1870 and 1890.

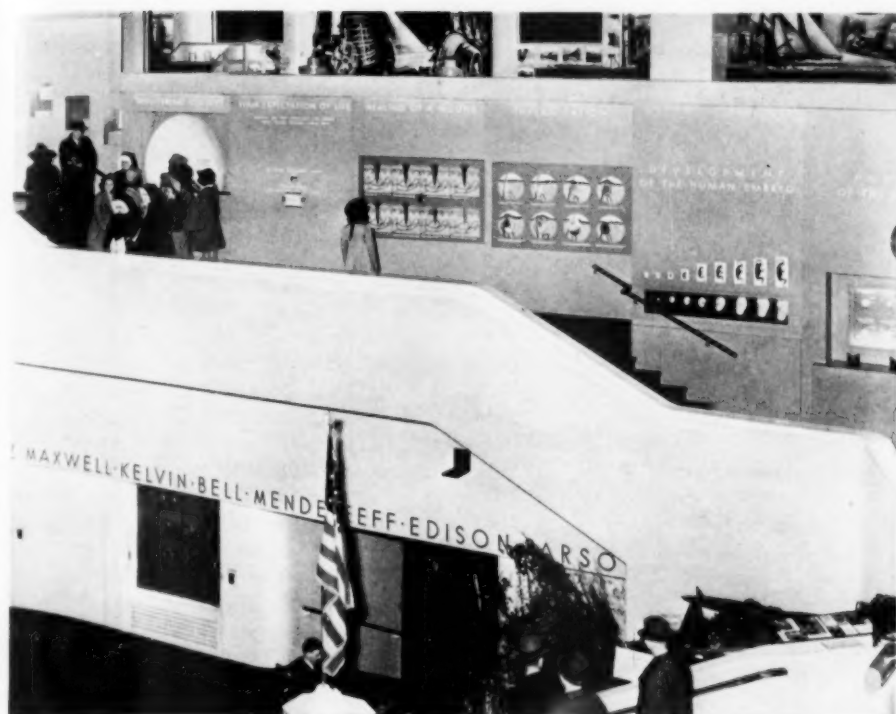
In the east, cities left behind by canal and waterway systems backed the railroads to recoup their economic losses. Thus the city of Baltimore bought \$500,000 dollars of Baltimore and Ohio stock and again tapped the freight sources of the west.

Journeys that took weeks and even months by other methods could be trav-

CONTRAST

A single century has seen progress in transportation from the covered wagon of pioneer days to the ultra-modern streamlined train.





MUSEUM OF SCIENCE AND INDUSTRY

elled in only days behind the steam locomotives and as the mass freight and passenger carriers of the nation the railroads came into the dominant position never since relinquished.

But with the turn of the century a new way of creating power and using it was slowly evolving in Europe. This new invention—the internal combustion engine—made possible first the automobile and then the airplane.

In the broad view the automobile put the emphasis on travel back where it mainly was a century ago—in the hands of the individual. Only it cut the confines of time and space tremendously.

In the early days of "automobiling" the new enthusiasts longed for a national network of good highways like the National Turnpike to Wheeling and the west. War and commerce have ever been the motives behind good roads and in America the growth of the railroads and waterway system took away the motive for a century. Thus in 1904 the nation had over 2,000,000 miles of roads but only a mere fraction suitable for the "new horseless carriage."

So swift has been the growth of the motor vehicle for private and public use that today there are more than 3,000,000 miles of roadways in the United States and nearly 400,000 miles of them are so surfaced that they can be travelled in any weather.

Just as the railroads created new cities in boom days, so has the automobile aided the growth of new towns and communities and—perhaps even more important—permitted existing cities to expand and, in some measure, gain new freedom from the previous hampering confines of less mobile transportation.

The New York Museum of Science and Industry's display of historic motor cars which have pioneered in this liberation of city crowding will attract many a visitor at the World's Fair there.

While the Fords, Olds, Duryeas, Wintons and Haynes of the nation were evolving their putt-putting converted buggies into what has become today's motor cars, the Wright Brothers were putting a compact little engine into their version of a glider and making it fly through the air.

From flights of 120 feet the airplane has surged onward to flights over all oceans and all continents; air speeds have risen from 40 miles an hour to over 200 miles an hour for commercial transports with military planes 200 miles an hour faster.

The end effect of the airplane on the national picture is still much in the future but its effect in the international field is manifest today in the aerial war threats which are intimately bound up with current war scares in Europe.

Science News Letter, April 29, 1939

JUST PUBLISHED SCIENCE IN PROGRESS

Edited by
GEORGE A. BAITSELL

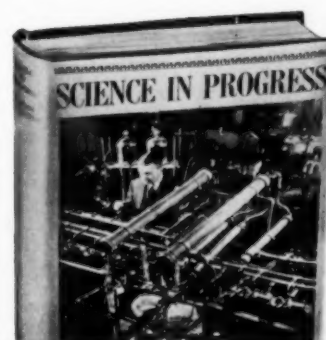
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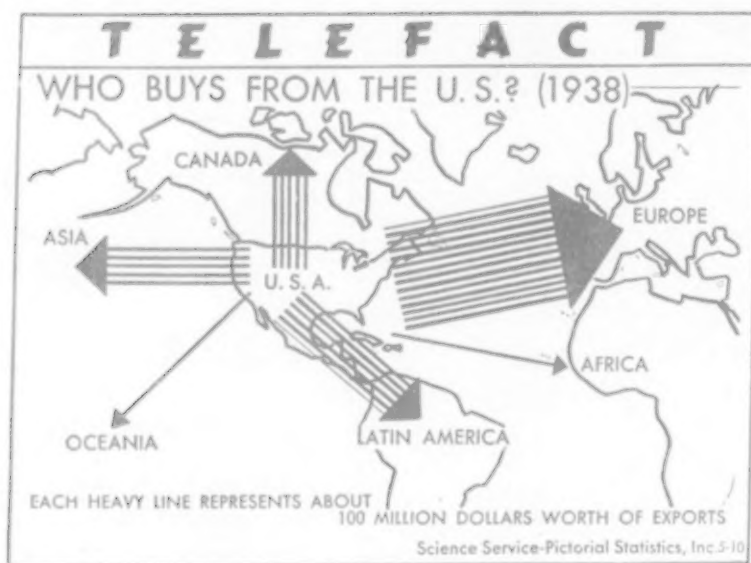
Ten recognized leaders in scientific experiment — including a Nobel Prize Winner — describe here the methods and results of their researches, taking pains to make clear the relationships between the newly acquired knowledge and that previously existing. The discoveries are of such importance as to make it essential to have the information accessible to everyone who is concerned with science. This volume, which is based on the National Sigma Xi Lectures delivered in 1937-38, has special value, since no other publication has had access to this material. Work in the interrelated fields of physics, chemistry, physiology, and biology is described here by men who are in the forefront of scientific research today. They report the latest progress in breaking down the atom, learning the functions of chromosomes, vitamins, hormones, and internal secretions, and measuring animal metabolism and the electrical potentials of the human brain.

The authors of the various chapters are E. O. Lawrence, University of California; H. C. Urey, Columbia University; W. M. Stanley, Rockefeller Institute; L. O. Kunkel, Rockefeller Institute; K. E. Mason, Vanderbilt University; R. R. Williams, Bell Telephone Laboratories; Edgar Allen, Yale University; T. S. Painter, University of Texas; E. N. Harvey, Princeton University; and F. G. Benedict, Carnegie Nutrition Laboratory.

Illustrated. \$4.00



Yale University Press
New Haven,
Connecticut



INVENTION

Several Hundred New Products Are Now Ready For Market.

Survey Made by General Motors for World's Fair Exhibit Dedication Reveals What You Can Now Buy

OVER a hundred leading corporations of America through their researches have several hundred new machines, products and materials about to come into commercial use, it is shown by a survey of "new horizons of industry" made by General Motors Corporation as a part of the dedicatory program of its World's Fair exhibit building.

New power plants for railroads, a new one-man harvester that handles everything from beans to bird seed, new silk-like and wool-like fibers made synthetically from coal and milk, unshatterable

eyeglasses made from plastic, new kinds of meats, novel electric lamps that are more efficient and colder, new chemicals to combat disease, better gasolines, edible fats from petroleum, low-cost roads, blow-out safe tires, new building materials from wood, new steels, faster photographic films—these are a few of the new industrial achievements made public when Alfred P. Sloan, Jr., General Motors' Chairman, asked fellow corporation heads: "What's new?"

Nearly 500 corporation executives and industrial leaders were Mr. Sloan's dinner guests at a preview of the elaborate "Highways to New Horizons" World's Fair building. A special dramatic performance and motion picture urged these guests to speed industry by developing new ideas and products through scientific research. Mr. Sloan and Dr. Charles F. Kettering, head of General Motors research activities, key-noted the value of more research in American industry.

Highlights in the industries-research survey include:

A new group of chemicals, the nitro-paraffins, made from natural gas, by the Commercial Solvents Corporation.

Synthesis of glycerine from propy-

lene, obtainable from oil, and the making of edible fats from oil and coal were reported by Shell Oil Company.

The one-man harvester that costs less than an automobile, capable of cutting, threshing, separating, cleaning and binning more than a hundred varieties of grains, beans and seeds, at a labor-cost of one man-hour per acre, is an Allis-Chalmers Manufacturing Company product.

A tractor with all-weather cab, radio, heater, and later to be air-conditioned, is a Minneapolis Moline Power Implement Company product.

A Monsanto Chemical Company development of phosphates permits the farmer to make hay while it rains.

Fiber containers for fluid milk is an American Can Company development.

A new translucent glazing product, spun glass between two pieces of flat glass, is going into production by Libbey-Owens-Ford Glass Company.

Pentothal, a synthetic thiobarbiturate used intravenously to produce anesthesia, and vitamin K to prevent and stop bleeding are new Abbott Laboratories developments.

A device for home use that precipitates dust from the air is a Westinghouse Electric and Manufacturing Company device.

Celotex Corporation reports a new covering for flat roofs that will transform them into play and recreation spaces at little cost.

Lead added in small quantities to both carbon and alloy steels by Inland Steel Company allows machining 30 to 50 per cent. faster.

Die casting of the light metal, magnesium, is reported by Doehler Die Casting Company.

A water-white resin, first plastic suitable for optical use, produced by Norton Company, is nearly unbreakable and will be used by eye-glassed athletes and workers in hazardous industries.

Synthetic bonds for plywood provid-

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Shell

Wyoming

ed by Bakelite Corporation will help construct homes, airplanes, furniture, boats and automobiles.

Diesel locomotives by General Motors Corporation and high powered steam turbine electric locomotives by General Electric Company will contribute to rail progress.

Roads for light traffic made by mixing cement with natural roadway soil right on the highway are developed by Portland Cement Association.

Rubber is taking on new forms for widespread use. Tough, thin, transparent, waterproof sheets of rubber are being made by B. F. Goodrich Rubber Company for use in protecting everything from clothes to food, while United States Rubber Company has a rubber sheet with many pores, useful in filtration and storage battery manufacture.

There is also a cellular hard rubber, as light as $4\frac{1}{4}$ pounds per cubic foot, useful in insulation against heat, and a new sponge rubber made from latex that will compete with metal springs, hair cushions, and mattresses.

Rubber tires are made more non-skid and blow-out proof.

Photographic film quadrupling the fastest speed of yesterday is reported by Agfa Ansco Corporation, while Eastman Kodak Company hails the coming of color to everyday photography.

A new low-cost plastic is about to be manufactured from wood by Masonite Corporation, while pentachlorophenol for wood preserving treatment produced by Monsanto Chemical Company will make wood a more permanent building material.

Science News Letter, April 29, 1939

Correction

IN THE Macmillan Company's advertisement of new scientific books on page 253 of the SCIENCE NEWS LETTER for April 22 the price of "The Races of Europe" by Carleton S. Coon was erroneously given as \$5.75. The correct price of this book is \$7.00.

Books

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Watch Parent Trees

FUTURE forests of the nation depend largely upon what we are doing now, especially in the selection of the trees that are to be their parents, Leon S. Minckler of the Appalachian Forest Experiment Station points out. (*Journal of Forestry*, April)

Application of the science of genetics to trees has lagged far behind the uses of genetics in other fields, he declares. This is only natural, perhaps, because a generation in trees is almost as long as it is in the human race, so that geneticists have found annual plants, like beans and wheat, more to their liking. And foresters have had so many other, more pressing problems that they have let tree-breeding problems wait.

Some of the things now being done in the reestablishment of our forests are rather doubtful, from the genetic point of view. Seed from lowland trees is used for planting upland areas, and some seed importations are made from as far away as Italy. Better practice, Mr. Minckler urges, would be to study local genetic strains and varieties and use the most successful of these, since they have already demonstrated their fitness under local conditions.

Relatively little of American reforestation is done by planting seeds or setting out nursery seedlings. Much more usual is the practice of leaving seed trees standing when a piece of land is logged off.

The selection of these seed trees would therefore seem to be of supreme importance. Yet too often the worst instead of the best trees are left, because lumber interests hate to "waste" a tree that will make profitable logs. Using cripples and runs for tree breeding is just as bad forestry as sending the best young men to war to be killed and leaving runs

and defectives as fathers of the next generation is bad eugenics.

However, even the abandonment of such bad seed-tree selection is not enough, Mr. Minckler emphasizes. We must not only avoid poor seed trees. We must intelligently select those that show the best qualities, and that give promise of being able to transmit those qualities through their seed to the next tree generation.

Science News Letter, April 29, 1939

From Page 263

In Illinois, the former will be at 10:21 p. h., C.S.T., and the latter at 11:37 p. m., C.S.T., while, for an observer in Washington, D. C., the times will be 11:52 p. m. and 12:59 a. m., E.S.T. The times are different for every location, but these given will help one to tell them approximately.

Celestial Time Table for May

Monday, May 1, 4:00 a. m., Mercury farthest west of sun; evening, Spica occulted by moon. **Tuesday, May 2**, 10:59 p. m., Algol at minimum. **Wednesday, May 3**, 10:15 a. m., full moon. **Friday, May 5**, 7:48 p. m., Algol at minimum. **Tuesday, May 9**, 5:00 a. m., moon passes Mars. **Wednesday, May 10**, 12:00 p. m., moon farthest from earth—251,200 miles away. **Thursday, May 11**, 5:40 a. m., moon at last quarter. **Sunday, May 14**, 6:03 p. m., moon passes Jupiter. **Tuesday, May 16**, 4:16 p. m., moon passes Venus. **Thursday, May 18**, 11:25 p. m., new moon. **Tuesday, May 23**, 12:42 a. m., Algol at minimum; 7:00 a. m., moon nearest earth—228,800 miles away. **Thursday, May 25**, 6:20 p. m., moon at first quarter; 9:31 p. m., Algol at minimum. **Sunday, May 28**, 6:20 p. m., Algol at minimum.

Science News Letter, April 29, 1939



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ASTRONOMY

New Comet Rides High in The Northwest Evening Sky

Brightest Comet of the Decade, It Shines Nearly as Brilliantly as the North Star; Found in Norway

LOOK quickly for the brilliant Hassel comet now glowing with its greenish haze in the northwestern sky, Harvard College astronomers advise.

The comet was nearest to the sun—and hence brightest—on April 10. It is now moving away from the sun and earth and will rapidly become fainter.

At eight o'clock in the evening it is still rather high in the sky in the northwest where it has entered the constellation of Perseus. In appearance the Hassel comet is a glowing hazy object easily distinguished from the pinpoints of light that mark the stars in the sky. Its long tail is visible to the eye and in small field glasses. The tail is about two degrees long, or as great as four apparent diameters of the full moon.

The new comet was discovered at the University Observatory, Oslo, Norway, on April 16 by the astronomer Hassel, according to cabled reports from Prof. S. Rosseland, director of the Norwegian Observatory, to Harvard Observatory, American clearing center for astronomical discoveries.

A more recent check on the comet's position comes from the observatory of the University of Copenhagen. Its position on the evening of April 18 was right ascension two hours, seven minutes and 58 seconds and its declination was plus 43 degrees, 15 minutes and 53 seconds, according to reports from Miss J. M. Vinter-Hansen, well-known astronomer at Copenhagen, and her associate, J. P. Möller.

Its position April 20, as determined at Lick Observatory, is right ascension two hours, 36 minutes, 30 seconds and declination plus 43 degrees, 50 minutes and six seconds.

Dipper a Guide

Easy way to find the new comet is to start with the Big Dipper and sight along the two stars which mark the "top" of the Dipper's cup. In the early evening these days the Dipper will be nearly at the top of its daily swing around the North Star.

Using the two Dipper stars to get the

approximate line, look to the west and find the very bright star Capella in the constellation of Auriga. This star will be about half way up the sky from the horizon.

Next look downward in the sky from Capella and to the right, which is north. Your eye should then come to a large triangle formed by second magnitude stars in the constellation of Perseus. This triangle is standing on its apex.

Just a bit lower in the sky than the bottom star of this triangle, and a bit to the north should be found the Hassel comet. If you come to a bright star in doing this it is probably the star gamma Andromeda, known as Almak. This means you have overshot your mark for the comet is about half way between Almak and the bottom star of the triangle in Perseus.

Science News Letter, April 29, 1939

PHYSICS—BIOLOGY

Atom Smasher Helps to Study Mystery of Body

WHILE the giant atom-smashing cyclotron apparatus of the physicists is primarily designed to study the structure of the atom it is rapidly being turned to more practical ends which have direct applications in the animal and human body.

One of the mysteries, which the cyclotron atom smashing is helping to solve, is the role of the chemical known as glutathione in the human body. This chemical is a sulfur compound apparently composed of known amino acids—glycine, cysteine and glutamic acid. But every effort so far to produce glutathione synthetically out of its parts so far has failed. Yet knowledge about its role and a method of synthesis are vitally needed because glutathione controls the behavior of important enzymes in the cells of the body.

Newest feat of scientists at the Biochemical Research Foundation of the Franklin Institute in Philadelphia is to create radio-active glutathione. This is done by growing yeast cells in a synthetic medium in which radio-active sul-

fate (obtained by cyclotron bombardment) is the only source of sulfur.

Under these conditions the yeast cells build up radio-active glutathione that can readily be detected in extremely small amounts by Geiger counters sensitive to disintegration radiations given off.

Reports the Foundation's Director, Dr. Ellice McDonald.

"Radio-active glutathione will be of great value in studies on the fate of this substance in the human body, as there is no knowledge of the mechanism of the action of this important body substance. With radioactive glutathione it will be possible to trace its course and possibly to explain the mechanism of the action. If this is done, it will be one more step towards explaining the riddle of life."

Science News Letter, April 29, 1939

CHEMISTRY

First Total Synthesis of Sex Hormone Equilenin

THE TOTAL synthesis of the female sex hormone equilenin—an important new advance in the chemistry of sexual activity in women—is announced by chemists of the University of Michigan.

Reporting to the *Journal of the American Chemical Society*, Prof. W. E. Bachmann, Wayne Cole and A. L. Wilds state:

"Although certain sex hormones such as estrone have been prepared from other naturally occurring compounds possessing similarities in structure, the total synthesis of none of them has yet been reported. We have now succeeded in accomplishing the total synthesis of the sex hormone equilenin."

Following closely the discoveries of Prof. Russell E. Marker of Pennsylvania State College that equilenin can be converted to estrone by reduction, the new Michigan research means that the total synthesis of these highly important sex hormones has now been accomplished.

Equilenin, chemically related to the sex hormone theelin found by Prof. Edward A. Doisy of St. Louis University School of Medicine, was reported by Drs. André Girard and Georges Sandulesco of the Roussel Research Laboratories, Paris, in 1932. Its name was given because it was first found in the urine of pregnant mares. Several tons of this material had to be used, in these early experiments, to extract about three grains of the hormone.

Science News Letter, April 29, 1939

SCIENCE NEWS LETTER Readers:

Here is a suggestion: Come and visit the Museum of Science and Industry while you are in New York for the World's Fair, or at any other time. You will find us on the street floor of the R. C. A. Building, Rockefeller Center.

We will show you *science in action*. Hundreds of fascinating exhibits in this unique "Hall of Motion" make the discoveries and inventions of the scientist understandable to those not technically trained in science.

Educators, physicians, specialists of all kinds—men and women in business, agriculture, or the professions alike—trained in science or not, find intellectually exciting experience at the New York Museum of Science and Industry.

If you have children of upper grade and high school age, bring them. They can operate many of the models themselves—and so can you. If you are wise, you will do so because by taking part in what you see, you will add to the richness of the stimulation of your own active intellectual curiosity.

We feel justified in assuming that your intellectual curiosity IS active, because *you are a reader of Science News Letter*. To see these exhibits will help you to enjoy *even more* your weekly copies of *Science News Letter*.

At the New York Museum of Science and Industry you will see marvels of electricity, the wonders of modern communication and transportation, the progress of mankind in housing, food, textiles, machinery and power—more than 2,000 exhibit units all yours to enjoy. The Museum is open from 10 A.M. to 10 P.M., weekdays and Sundays. Adults 25c, Children 10c.



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First Glances at New Books

Biography

PIONEER GIRL, The Early Life of Frances Willard—Clara Ingram Judson—*Rand, McNally*, 80 p., 50 c. Delightfully written for children and delightfully illustrated, this book tells about a little girl born just a century ago; she grew, later, to be very famous, and was a real pioneer in education, woman suffrage, and a host of other activities. But this book stops with her eighteenth birthday.

Science News Letter, April 29, 1939

Economics—Mining

MINERAL VALUATIONS OF THE FUTURE—C. K. Leith—*Amer. Inst. of Mining and Metallurgical Engineers*, 116 p., \$1.50; To members, \$1. Written primarily for the younger man in mining engineering, this volume discusses the significance of mineral values; new conditions, such as economic nationalism and other developments of a changing world, affecting them; future production and the time element—life and deferment cost; selling prices; profit; rate of profit in a mining investment and scarcity values. Prof. Leith concludes that on the whole the outlook indicates lower values for the private mine owner.

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Engineering

DIESEL ENGINES, THEORY AND DESIGN—Howard E. Degler—*American Technical Society*, 270 p., \$2.50. Prof. Degler's book is the fifth in a series on the Diesel engine, prepared by the same publisher. That the reader has a knowledge of the principles of mechanics is assumed. The efficiency of internal combustion engines; thermo-dynamics of internal combustion cycles; fuels, combustion and combustion chambers; testing and performance; principles of engine design and design of major engine parts are covered.

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Physics—Engineering

THE GYROSCOPE: ITS PRACTICAL CONSTRUCTION AND APPLICATION (Reissue)—P. P. Schilovsky—*Chem. Pub. of N. Y.*, 224 p., \$3.50.

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Geography—Political Science

ELEMENTS OF POLITICAL GEOGRAPHY—Samuel Van Valkenburg; Cartography by Franklin C. Erickson—*Prentice-Hall*, 401 p., \$3.50. Europe's troubles today, as Germany goes about undoing the post-war settlement, make this new book

interesting reading. And it recalls to our attention the fact that in the last analysis, many of today's moving events find their root in fundamental natural facts; distribution of resources, relation of peoples to available land, etc.

Science News Letter, April 29, 1939

Engineering

CITY PLANNING, WHY AND HOW—Harold MacLean Lewis—*Longmans, Green*, 257 p., \$2.50. Written primarily for the layman, this book discusses city planning in terms of its relation to everyday life. The first half of Mr. Lewis' volume takes up the "whys" of city planning, and the second half, the "hows".

Science News Letter, April 29, 1939

Psychology

PSYCHOLOGICAL FOUNDATIONS OF PERSONALITY—Louis P. Thorpe—*McGraw-Hill*, 602 p., \$3.50. This work is intended as a text for teacher-training courses in this field and to clarify for teachers the many references to personality occurring in the literature they study. The author is a consulting psychologist and professor of education at the University of Southern California.

Science News Letter, April 29, 1939

Child Study

CHARACTER, GROWTH, EDUCATION—Fritz Kunkel; Barbara Keppel-Compton and Basil Druitt, translators—*Lippincott*, 348 p., \$3.50. A book based on the authors' "we-psychology" of interest to educators of young children and those in the field of child guidance.

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Education

EDUCATION OF THE HANDICAPPED. Vol. 1, History—Merle E. Frampton and Hugh Grant Rowell, eds.—*World Book Co.*, 260 p., \$2.40. The blind, the deaf, those with speech defects, the crippled, the tubercular, the mentally deficient and the delinquent all need special care. Historic methods and modern attitudes are both discussed here, in material assembled by members of the faculty at Teachers College, Columbia University.

Science News Letter, April 29, 1939

Education

VOCATIONAL EDUCATION—John Dale Russell and associates—*Govt. Print. Off.*, 325 p., 40 c. Prepared for President Roosevelt's Advisory Committee on Education as a report on the program of federal aid in this field.

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History—Engineering

THE ROMANCE OF AMERICAN TRANSPORTATION—Franklin M. Reck—*Crowell*, 253 p., illus., \$2.50. A survey of the complex transportation system which has been developed in the United States since earliest days. Like any such systematic and historic volume as this, a few slight inaccuracies are to be noted, but they are not of much importance. The book is generally one of the most ably handled volumes in this class. The illustrations are excellent.

Science News Letter, April 29, 1939

Ornithology

THE WATCHER AT THE NEST—Margaret Morse Nice—*Macmillan*, 159 p., \$2. Sitting in a blind to watch the doings of small birds not only yields interesting information but gives excellent practice in the somewhat neglected virtue of silent contemplation. Results of much activity of this kind are beautifully evident in this book.

Science News Letter, April 29, 1939

Botany

THE LEGUMINOUS PLANTS OF WISCONSIN—Norman C. Fassett—*Univ. of Wisconsin Press*, 157 p., \$3. A carefully done, excellently illustrated monographic treatment that will be invaluable to field botanists in Wisconsin and the Midwest generally, and to taxonomists everywhere.

Science News Letter, April 29, 1939

Psychology

THE THEORY AND PRACTICE OF PERSONAL COUNSELING—Hugh M. Bell—*Stanford Univ. Press*, 167 p., \$1.25. Recommendations for the use of the author's Adjustment Inventory and information regarding the method by which it was developed. A photolith book.

Science News Letter, April 29, 1939

Psychology

NEW WAYS IN PSYCHOANALYSIS—Karen Horney—*Norton*, 313 p., \$3. A follower of Freud, former secretary of the Berlin Psychoanalytic Institute, writes this "critical re-evaluation of psychoanalytical theories" because of a dissatisfaction with therapeutic results and the inadequacy of these theories for solving all the problems of the patient.

Science News Letter, April 29, 1939

Psychology—Medicine

THE DOCTOR PRESCRIBES MUSIC—Edward Podolsky—*Stokes*, 134 p., \$1.50. Urging music for ills, both mental and physical.

Science News Letter, April 29, 1939